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International harvester company

Farm implements.

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Feed Grinder



INTRODUCTION

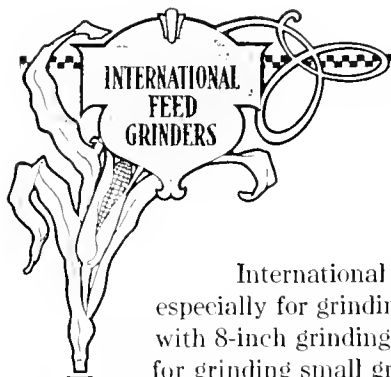
It is a generally recognized fact that less ground grain is required to produce a given amount of milk, meat, or work, than whole or unground grain. The average saving in whole grain by the use of the feed grinder, has been placed by a prominent authority at 12%; many single instances showing the amount saved to be as high as 35%.

The mission of the feed grinder is to so prepare or treat the grain that its full nutritive value can be wholly utilized for all feeding purposes on the farm. A trial of the machine forcibly emphasizes its value. A complete description, with numerous illustrations of the chief points of merit of the INTERNATIONAL FEED GRINDERS are given in the following pages.

INTERNATIONAL HARVESTER COMPANY OF AMERICA

CHICAGO

U S A



The International Feed Grinder

International feed grinders are built in two types, B and C. Type B is designed especially for grinding corn on the cob. This style of mill is built in two different sizes—one with 8-inch grinding plates and a larger size with 10-inch grinding plates. Type C is designed for grinding small grain only, such as wheat, barley, oats, shelled corn, etc., and those wishing a high speed mill that will grind small grain very rapidly will find this type especially efficient. This type of mill is built in one size only with 8-inch grinding plates.

Capacity of International Feed Grinder

The capacity of the International feed grinder varies according to the condition of the grain, fineness to which the grain is reduced, the speed at which the grinder is run, and the amount of power used. It is difficult to make a definite statement regarding the capacity of the grinder, as these four factors vary so greatly. The following table indicates the capacity of the grinder for different grains, when the machine is operated at maximum speed with a proportionate horse power gasoline engine, and the grain is in average condition:

| SIZE | Ear corn per hour | Shelled corn per hour | Mixed grain, corn and oats, etc. per hour |
|---------------|----------------------|--------------------------|---|
| 8-inch Plate | 8 to 35 Bu. | 15 to 35 Bu. | 12 to 25 Bu. |
| 10-inch Plate | 15 to 50 Bu. | 20 to 50 Bu. | 20 to 40 Bu. |

The table below indicates the speed of the International feed grinder when operated with an I H C gasoline engine equipped with regular pulley from 4 to 20-horse power. In order to secure the greatest capacity with these grinders, they should be operated at maximum speed. This will permit feeding the grinder to its fullest capacity. The minimum speed for the 8 and 10-inch grinders is 300 revolutions per minute, and the maximum speed, when the fly wheel is used, is 600 revolutions per minute. When run at a speed above 600 revolutions the fly wheel should be removed.

| Engine | | | International Feed Grinder | | | | | | |
|----------------|---------------------------------------|-------|------------------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Horse Power | Diameter of Regu- lar Plain Pulley | Speed | Speed with Regular Pulley | Speed of Grinders with Special Pulleys | | | | | |
| | | | Diameter 12 inches | Diameter 8 inches | Diameter 10 inches | Diameter 14 inches | Diameter 16 inches | Diameter 18 inches | Diameter 20 inches |
| 4 | 12-inch | 400 | 400 | 600 | 480 | 342 | 300 | 266 | 240 |
| 6 | 16-inch | 325 | 433 | 650 | 520 | 371 | 325 | 290 | 260 |
| 8 | 18-inch | 310 | 465 | 697 | 558 | 398 | 348 | 310 | 279 |
| 10 | 20-inch | 300 | 500 | 750 | 600 | 428 | 375 | 333 | 300 |
| 12 | 24-inch | 300 | 600 | 900 | 720 | 511 | 450 | 400 | 360 |
| 15 | 26-inch | 250 | 541 | 812 | 650 | 464 | 406 | 361 | 325 |
| 20 | 28-inch | 240 | 560 | 840 | 672 | 480 | 420 | 373 | 336 |

Pulleys on 8-inch grinder, 5 1/4-inch face

Pulleys on 10-inch grinder, 6 1/4-inch face

International 8-Inch Feed Grinder

TYPE B

This grinder has sufficient capacity for the needs of the average farmer. It can be driven with from 4 to 10-horse power, the capacity of the mill being determined by the amount of power used, the speed at which the mill is run, the condition of the corn, and the fineness of grinding. This style of mill will run at about 75 revolutions per minute for each horse power, and do satisfactory work, but to secure the best results the mill should attain a speed of not less than 300 revolutions per minute. The speed can be increased to 600 revolutions with perfect safety.

When grinding dry corn on the cob with a 4-horse power engine, the speed should be about 300 revolutions per minute, at which speed the capacity will be from ten to fifteen bushels per hour; whereas, if an 8-horse power engine were used, the speed would be about 600 revolutions per minute, and from 30 to 36 bushels could easily be ground.



International 8-Inch Feed Grinder
Type B

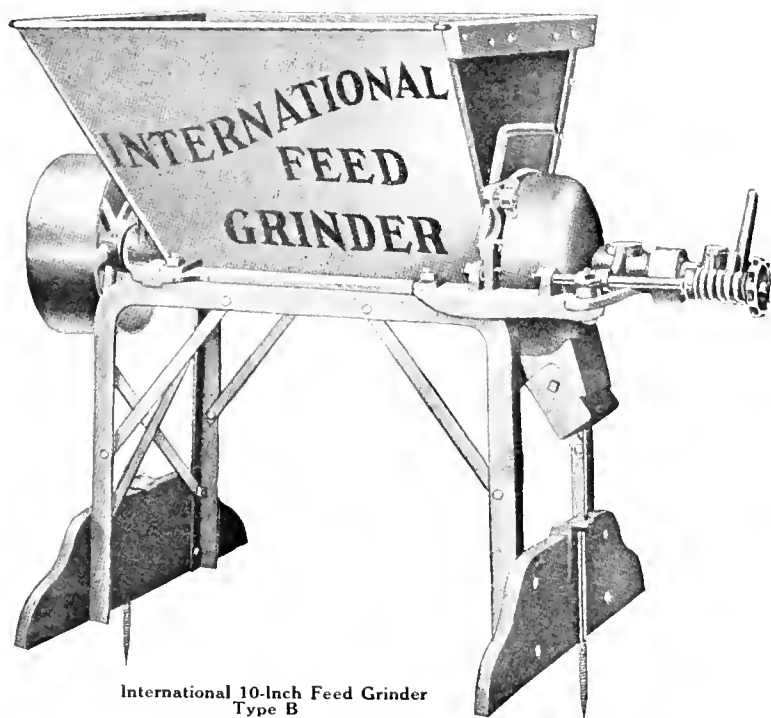
Specifications of the 8-Inch Feed Grinder

Power 4 to 10-horse power.
 Speed From 200 to 600 revolutions (75 revolutions per minute for each horse power).
 Capacity From 8 to 35 bushels per hour (capacity is determined by the speed and power).
 Hopper Opening { Top, 21 x 25 inches.
 Bottom, 14 x 7 inches.
 Floor Space 24 x 27 inches.
 Main Shaft 1 7/8 inches.
 Pulleys 8, 10, 12, 14, 16, 18, or 20-inch pulley with 5 1/4-inch face will be furnished with this feed grinder. However, unless otherwise specified, the 12-inch pulley is regularly furnished.

International 10-Inch Feed Grinder

TYPE B

In construction the 10-inch feed grinder is very similar to the 8-inch grinder. The frame and hopper, however, are 8 inches longer and the main shaft has a larger diameter. This grinder has proved to be exceptionally popular with dairymen, stockmen, and feed-store men, where a large size grinder is required. Six to 15-horse power may be used to operate this



International 10-Inch Feed Grinder
Type B

grinder. When corn is dry and in good condition, this grinder running at a speed of from 35 to 40 revolutions per minute, for each horse power, will grind from 15 to 60 bushels of ear corn per hour.

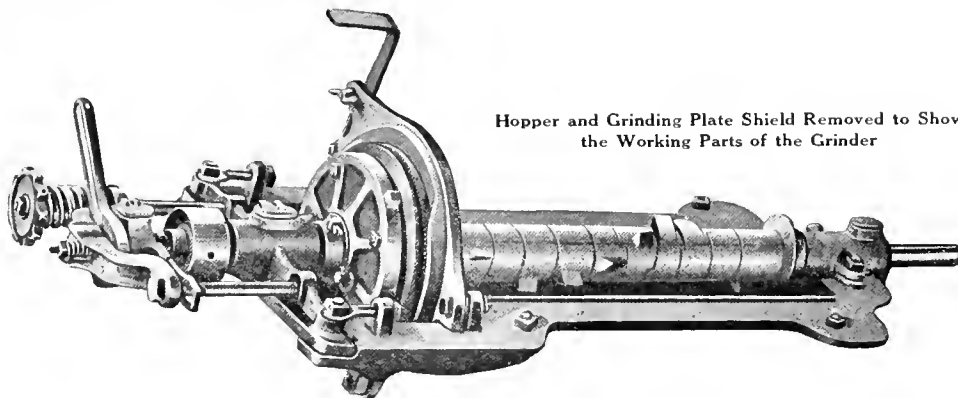
In breaking and grinding corn on the cob, 350 to 500 revolutions per minute generally gives the best results. When a larger engine is used this feed grinder can be run up to 700 revolutions per minute. As a precaution, however, the fly wheel should be taken off whenever the speed goes over 600 revolutions per minute.

Specifications of the 10-Inch Feed Grinder

Power 6 to 15-horse power.
 Speed 300 to 600 revolutions per minute (35 to 40 revolutions per minute for each horse power).
 Capacity 15 to 50 bushels per hour (capacity is determined by the speed and power).
 Hopper Opening (Top, 25 x 29 inches.
 (Bottom, 22 x 7 inches).
 Floor Space 30 x 32 inches.
 Main Shaft 1 $\frac{1}{8}$ inches.
 Pulleys 10, 12, 14, 16, 18, or 20-inch pulley, 6 $\frac{1}{4}$ -inch face, will be furnished with this grinder; however, unless otherwise specified, the 12-inch pulley is regularly shipped.

Large Steel Hopper

The hopper is exceptionally large and is made of sheet steel. The inside of the hopper is perfectly smooth. There are no projections to obstruct the grain. It is reinforced at the top to prevent it from being bent out of shape.



Hopper and Grinding Plate Shield Removed to Show
the Working Parts of the Grinder

Breakers

The breakers which mash up the cobs and also act as a force feed in working the grain toward the grinding plates, are all located on the steel shaft as is shown in the illustrations below. The points of these breakers are chilled which insures lasting qualities. The chilled concave is placed just below the breakers, being fastened to both sides of the frame with wooden pins. This construction eliminates the possibility of springing the main shaft and breaking the grinder should a stone or a piece of iron get into the hopper, as the wooden pins will snap before the grinder is damaged. The flow of grain into the grinding plates is regulated



Steel Shaft Showing Arrangement of regular cob Breakers, 10-inch Grinder



Full Spiral Breaker on 8-Inch Grinder



Half Spiral Breaker, 8-inch Grinder



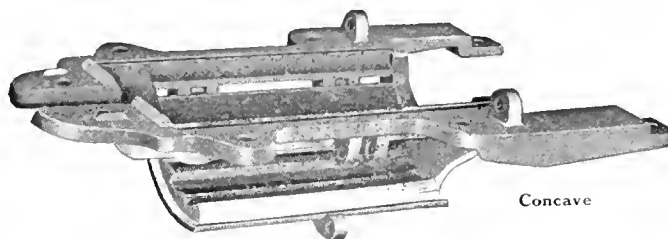
Regular Breaker with Spiral Points, 8-inch Grinder

The illustrations above show the different styles breakers which can be furnished with either 8 or 10-inch, Type B, Grinders

INTERNATIONAL FEED GRINDERS

by means of a shut-off which is operated by a small lever just above the grinding plates.

This shut-off leaves nothing to wish for as not a particle of grain is admitted into the grinding plates when it is closed.



Concave

Spring Tension

The grinding plates are held in position by a heavy spring which minimizes the danger of breakage of the plates should a hard foreign substance get into the grain. The grinding plates are held apart by a shoulder on the tension rod which prevents the spring from forcing them together when there is no grain in the mill. Breakage is further guarded against by a very convenient lever located at the end of the shaft. By means of this lever, it is possible to separate the plates without changing the adjustment.

Grinder Parts

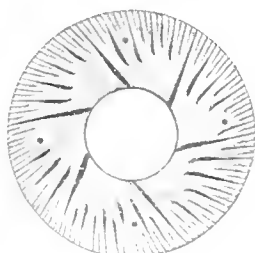
The crushing and grinding parts of the International feed grinder are driven by the heavy steel shaft which extends through the grinder. This shaft runs in extra long anti-friction Babbitt bearings. The stationary grinding plate is bolted to the frame of the mill, while the running plate is attached to the shaft, and is self-aligning. This self-alignment is secured by means of a ball-and-socket connection which permits the running plate to align itself at all times to the one on the frame. This construction, among other great advantages, insures an even running mill and evenly ground feed. The cross section illustration on this page shows the construction of the ball-and-socket connection.

The end thrust of the shaft is taken up by a ball bearing.

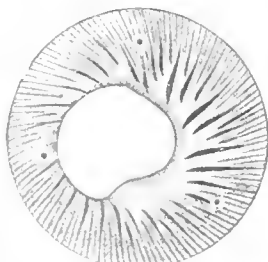
Cross Section Showing
Self-aligning Plate
Holder.
Self-alignment is Secured
by Means of Ball and
Socket Connection

Grinding Plates

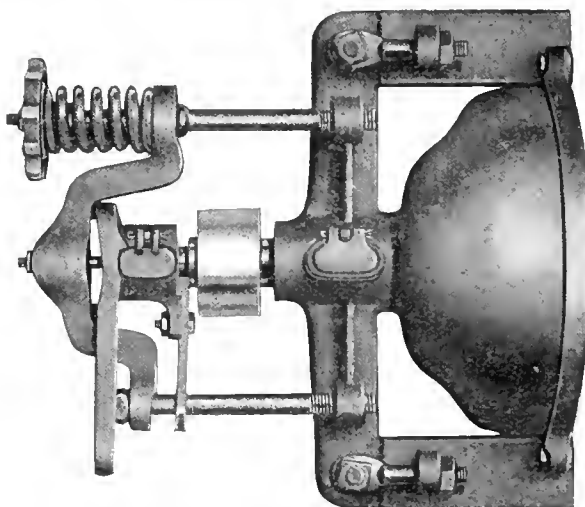
This type grinder is regularly equipped with one pair of medium grinding plates and one pair of fine grinding plates. At a slight additional cost, one pair of coarse or extra fine grinding plates can be secured.



Running Plates



Stationary Plates



View Showing Spring Tension and Lever

Sacking Elevator Attached to the
10-Inch Feed Grinder



Sacking Elevator

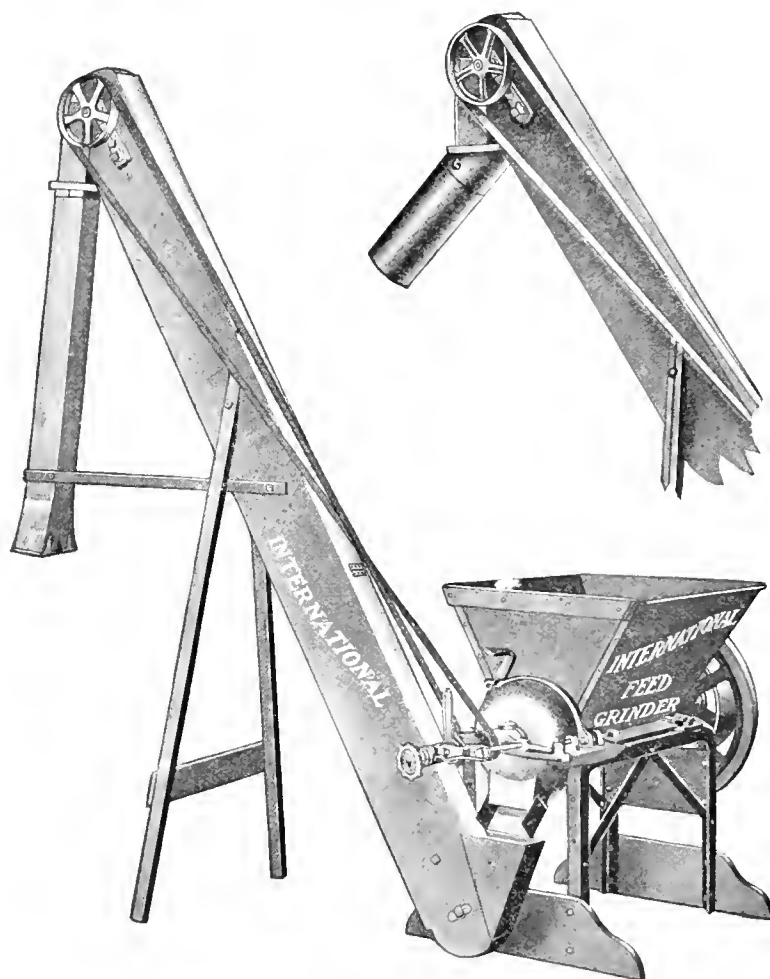
The chief feature of this elevator is a divided spout to which two sacks can be attached at the same time; while one sack is being filled, the other may be removed and another quickly adjusted in its place. This is a very convenient elevator for putting ground feed into sacks. It is well made, efficient, and can be attached either to the right or left of the grinder. Both sacking and wagon elevators can be readily attached to the Types B, 8-inch and 10-inch mill or Type C. The wagon elevator is shown on the following page.

Extras

A large, heavy fly wheel is furnished with the International feed grinder as an extra at a slight additional expense. Special breakers, shown on page 5, to take the place of the regular breaker, will also be furnished at a nominal cost.

Wagon Elevator Attachment

Any farmer who uses a wagon elevator attachment will testify as to its time and labor-saving properties. When ground feed is to be placed in a wagon, or bin, this elevator delivers it direct without handling. It is made of well-seasoned lumber and is very strongly put together. The conveyor, should it become slack, can be tightened very easily by means of adjustable tighteners with which the upper shaft is provided.



Wagon Elevator Attachment

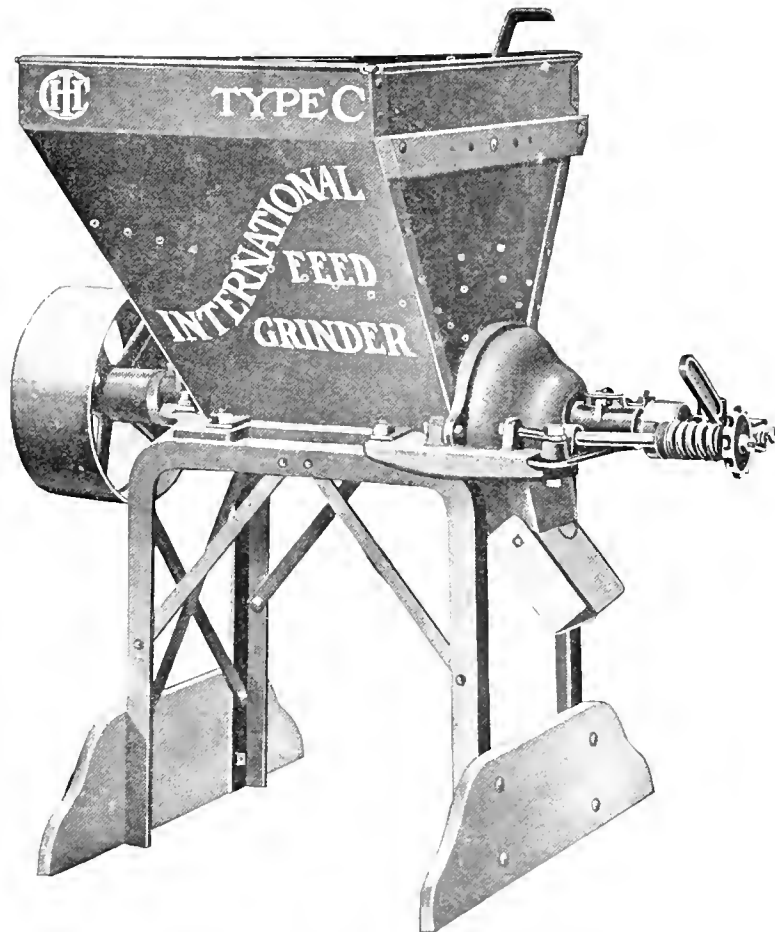
The illustration shows the elevator equipped with a wagon spout and a sacking attachment which are interchangeable on this elevator. The wagon spout works on a swivel and can be adjusted to deliver the ground feed in any desired direction. It can also be removed very easily when the sacking attachment is to be used. The wagon spout is shipped regularly with the wagon elevator. If a sacking attachment, which can be secured at a slight additional expense, is desired in place of the wagon spout, it should be so stated when ordering.

International 8-inch Small Grain Grinder TYPE C

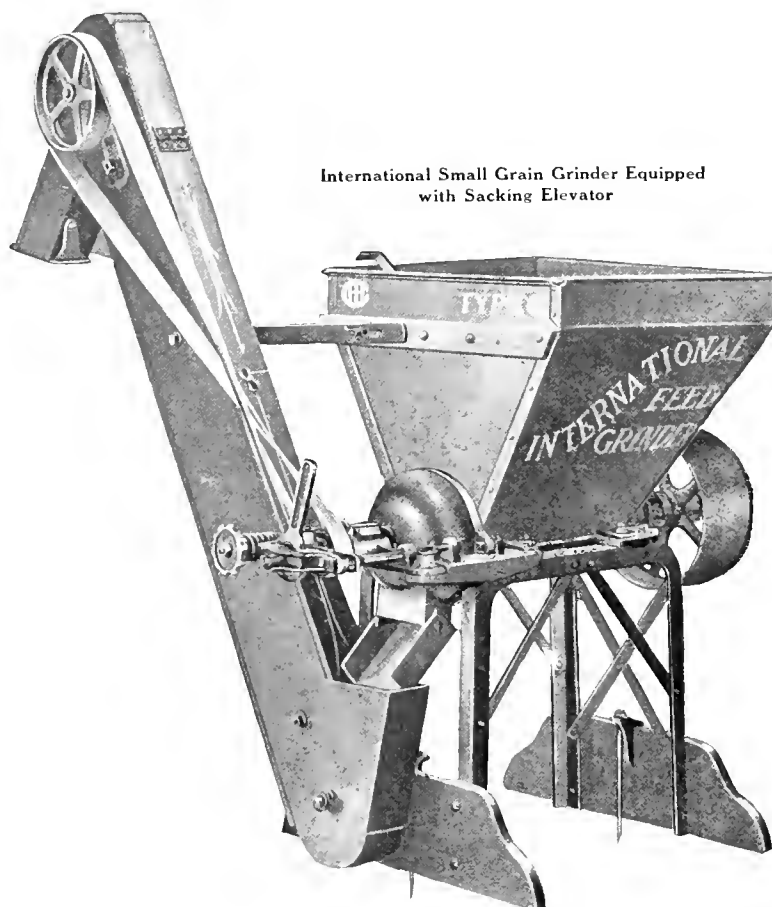
Farmers wishing to grind small grain, such as wheat, oats, barley, shelled corn, etc., will find that the Type C small grain grinder will supply this want. It was especially designed to grind satisfactorily all such small grains. It is built along the same lines as the International Type B feed grinder described on the preceding pages, with the exception that the arrangement of the hopper is entirely different. In place of the breakers on the regular feed grinder, this hopper has a bottom that is inclined toward the grinding plates. This bottom is securely riveted to the sides of the hopper and directs the grain into a worm feed which forces it into the grinding plates.

Where a mill is wanted that will grind small grain in large quantities, this mill will be found eminently desirable. The speed at which this mill is run and the amount of power used determines its capacity. Each horse power will develop 175 revolutions per minute and the mill should be run at a speed of from 800 to 1,500 revolutions per minute.

A very superior feature of this feed mill is its adjustable shut-off. By means of this shut-off, the feed may be closed down or regulated so that it can be operated with as low as 4-horse power. The amount of grain, the horse power used, and the speed, determine the capacity. Of ordinary small grain, this mill will grind from 10 to 50 bushels per hour. With 1,200 revolutions per minute and a 6-horse power engine 25 to 35 bushels of oats per hour can be ground. This mill does not require a fly-wheel.



International 8-Inch Small Grain Grinder Type C



International Small Grain Grinder Equipped
with Sacking Elevator

Specifications of the International Small Grain Grinder

| | |
|----------------|--|
| Power | From 4 to 10-horse power. |
| Speed | From 800 to 1,500 revolutions (175 revolutions per minute for each horse power). |
| Capacity | 10 to 50 bushels. |
| Hopper Opening | Top, 21 x 25 inches. Bottom, 15 x 17 inches. |
| Floor Space | 23 x 28 inches. |
| Main Shaft | 1 $\frac{7}{8}$ inches. |
| Pulleys | 5, 8, 10, or 12-inch pulley with 5 $\frac{1}{4}$ -inch face will be furnished with this mill. However, unless otherwise specified, a 6-inch pulley is regularly furnished. |

Worm Feed

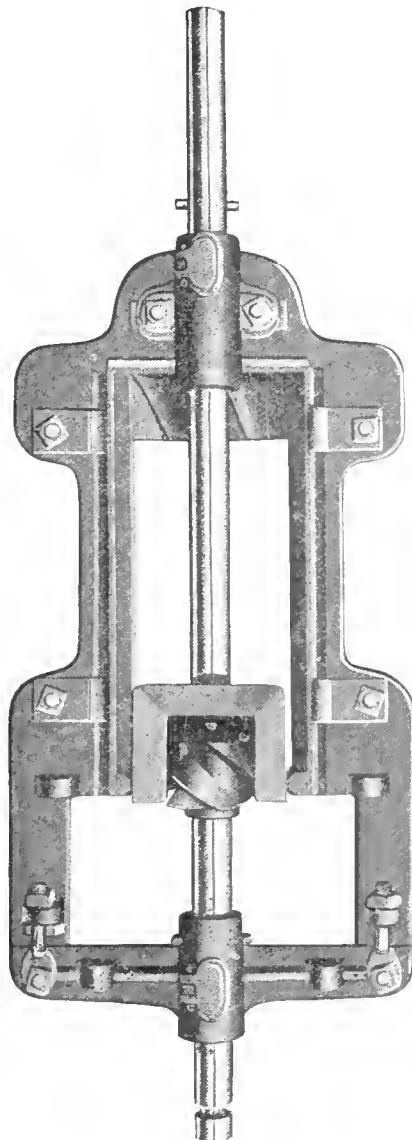
The International Small Grain Grinder has a worm feed which forces the grain into the grinding plates very rapidly. The speed may range anywhere from 800 to 1,500 revolutions per minute. To grind a large quantity of grain, it is essential that this mill be operated at a high rate of speed. The worm feed is a great advantage and is a very efficient factor in regulating the amount of grain going into the grinders, thus preventing over-loading.

In the illustration on this page the hopper and grinding plates are removed from the mill to show the construction of this worm feed.

Rate of Feed

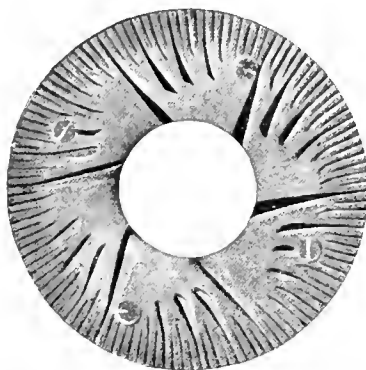
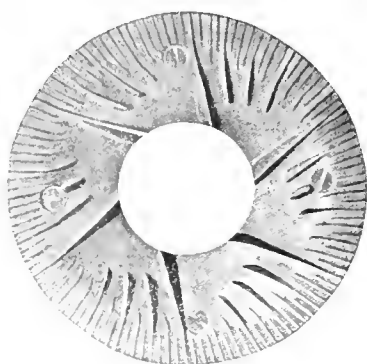
The amount of grain which is fed into the grinding plates is regulated by an adjustable shut-off located in the hopper just over the worm feed. This shut-off is so arranged that the mill can be operated not only with a 4-horse power engine, but equally well with an 8 or 10-horse power engine.

The shut-off, which has proved itself in every way satisfactory, has been no small aid in making the International small grain grinder popular.



Hopper and Grinding Plates Removed to Show
Construction of Shaft and Feed

Grinding Plates

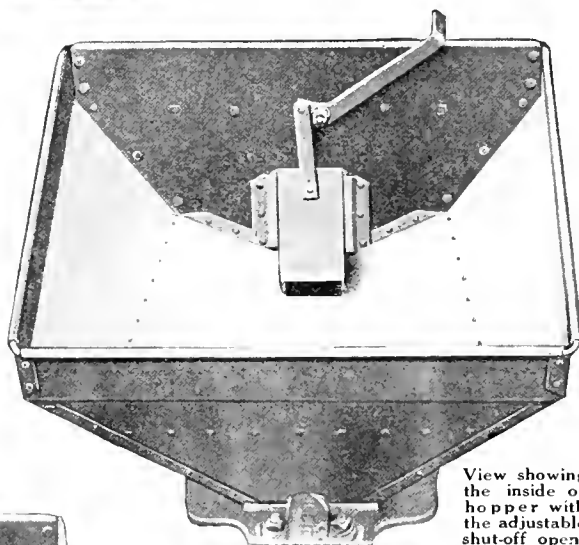


Grinding Plates

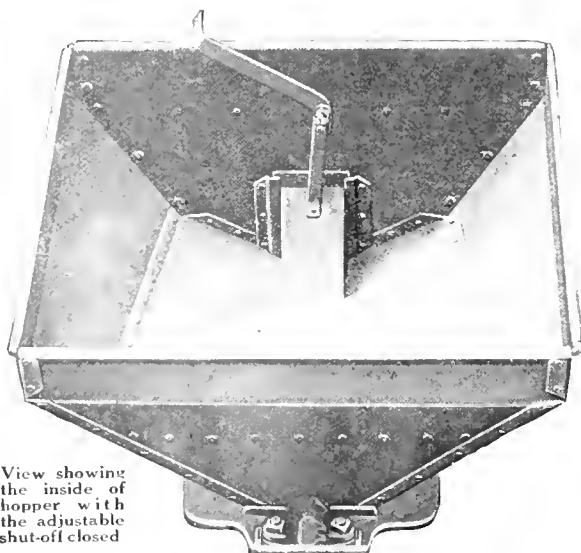
Both running and stationary grinding plates on the Type C feed grinder are alike. Three different styles of plates can be used in this grinder - coarse, medium, and fine.

Hopper

The hopper is strongly made of sheet steel and is thoroughly reinforced at the top, the outer rim being turned completely over around an iron rod. This construction prevents the hopper from being bent or damaged as is frequently the case. This hopper is constructed with a bottom which inclines toward the opening just above the worm feed. The inside of the

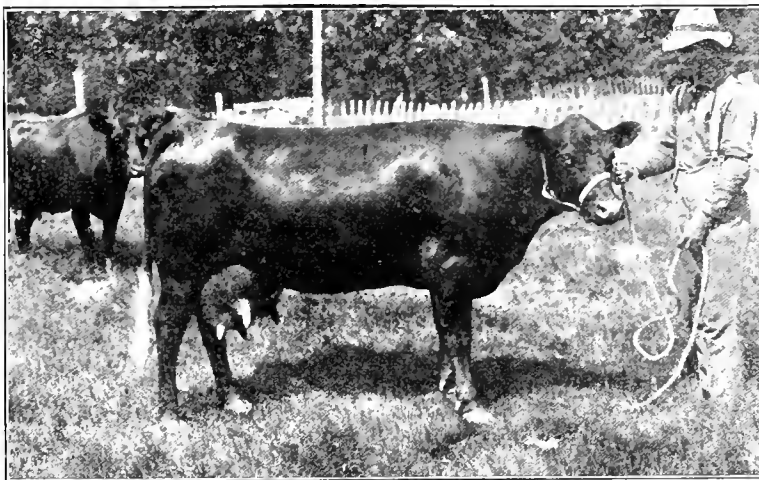


View showing the inside of hopper with the adjustable shut-off open



View showing the inside of hopper with the adjustable shut-off closed

hopper is perfectly smooth and there are no projections to obstruct the grain. The shut-off shown in the two accompanying illustrations is a very desirable feature of this grinder as it permits only the desired amount of grain to be fed into the grinding plates. It can be adjusted according to the amount of power. When this shut-off is closed, no grain can get into the grinding plates.



Ground Feed Not Only Makes Fine Beef but Also Increases the Milk Yield

Advantages of Ground Feed

Prof. W. J. Kennedy of the Iowa State College, in an article in the *FARMER'S TRIBUNE* on the subject of grinding feed for live stock, says :

"A careful study of the experiments conducted by the various experiment stations under a variety of conditions and with different classes of stock, has invariably shown that it requires less ground grain to produce a given amount of milk, meat, or work than it does when whole or unground grain is used. In some instances the difference is very wide—as high as 35 per cent being saved by grinding, while in other instances the difference is not very marked. Averaging up the results of all the tests reported, we find that there is a saving of about 12 per cent effected by grinding feed for the various classes of animals.

"The above calculations are based on simply the cost of grinding and the feed saved by doing so. They do not take into consideration the influence which ground feed may have on the animal. In some instances where animals are out of condition or are teething, it may be almost necessary to feed ground feed regardless of the price of feed stuffs or of grinding the grain. Cases of this kind must always be considered. So far we have treated the matter in a general way. We will now discuss it in a different way, treating each of the various classes of stock independently of the others. For horses at real hard work, and especially if they are worked long hours, all the grain should be ground and mixed with chopped hay. By so doing you will save the horse a lot of time and energy, both of which are important considerations in the case of the hard-worked horse. Old horses with poor teeth should always be fed on ground grain, as it is impossible for them to make good use of whole grain. Colts, during the spring months, or at any other season of the year when they are shedding their teeth, should have ground grain, so as to prevent any unnecessary use of the jaws during such a period.



Ground Feed Produces Fine Pork

"When it comes to the cattle-feeding business, several factors must be considered. The grinding of grain is generally done for the purpose of aiding digestion, thus causing less waste of the grain fed. Where hogs are used as followers in the cattle-feeding business, there is not much chance for waste in this connection. What the cattle fail to utilize, the hogs clean up, so that the two together make a very good combination. These methods of feeding became almost a universal practice during the times of low-priced feed stuffs and scarcity of labor. In those days everything was done with but one object in view, which was to save labor. Corn was scooped into feed troughs and the animals ate what they wanted, and the rest was thrown out to be eaten by the hogs or tramped in the mud, depending on the condition of the feed lot.

"Things have changed during the past few years. When feed stuffs are high in price and hogs are not available to follow the cattle, all feed should be ground. For a quick finish and good results in the feed lot, the following method of feeding is quite often adopted, and usually with good results:

"The cattle are started on snap corn, on which they are fed about four weeks. They are then fed on shelled corn, crushed corn, or corn and cob meal for about six weeks. From this time on they are fed on corn meal and some supplementary feed, such as oil meal, gluten feed, cottonseed meal, or dried blood. Such a method would always involve the grinding of feed. Corn and cob meal has given very good results, and in feeding experiments has given equally as good results, pound for pound, as corn meal. It is shown that corn and cob meal gave the best daily gain in both cases. In one instance less corn and cob meal was required for a given gain, while in the other, more was required. The average of the two trials shows that a pound of corn and cob meal is equal to a pound of pure corn meal in steer feeding. In explanation of the marked difference in the amount of feed required for a given gain in two trials, we have the following statement concerning the cattle: 'The first lot of steers were a thin, half-grown lot of "natives," while the second lot were high-grade short-horns, mature and full-fleshed at the start.' The second lot was also fed for a longer period.

"For dairy cows giving a large flow of milk, all kinds of grain should be ground. Corn and cob meal, when fed with oil meal or gluten feed, is preferable to corn meal. Corn and cob meal is a more bulky food than corn meal, thus better adapted to the needs of the cow from a digestive standpoint. Animals under one year of age can make as good use of whole grain as they can of ground feed, thus there is no need of going to the expense and trouble of grinding feed for them. Breeding stock usually makes better use of corn and other grain when ground, except in the case of corn when it is fed in the snapped form.

"A large number of experiments have been conducted for the purpose of determining the value of grinding grain for swine, and on averaging all the results it has been found that the grinding of the various kinds of grain effects a saving of about eight per cent of the grain fed."

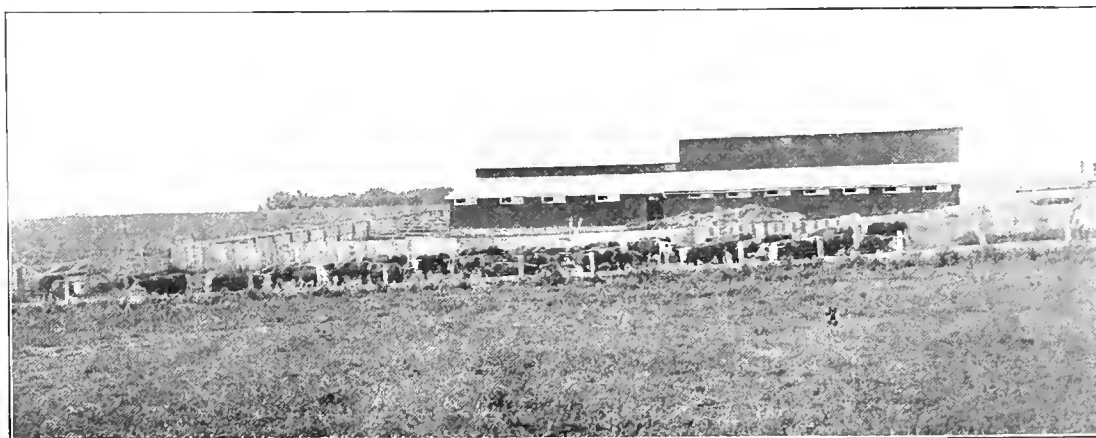
Experiments that have been conducted prove and authorities agree that cows give more milk and horses are capable of more work when their feed is ground; cattle, hogs and sheep can be fattened more rapidly with ground feed than with whole grain. Feeding whole grain is very expensive, and it is a profitable investment to have a feed grinder on the farm where it is ready for use when desired.

It Pays to Grind Corn Cobs

The following is an analysis of corn and cobs under the signature of H. E. Wiley, United States Agricultural Chemist, at Washington, D. C.

| | Cobs | Kernels |
|--------------------|----------------|----------------|
| Water | 9.33 per cent | 10.49 per cent |
| Ash | 1.33 per cent | 1.55 per cent |
| Oil | .47 per cent | 5.49 per cent |
| Carbohydrates..... | 56.01 per cent | 67.72 per cent |
| Crude Fibre..... | 30.36 per cent | 2.13 per cent |
| Albuminoids | 2.50 per cent | 10.62 per cent |

The analysis shows that corn cobs are of value, and should be utilized in connection with the kernels grown upon them.

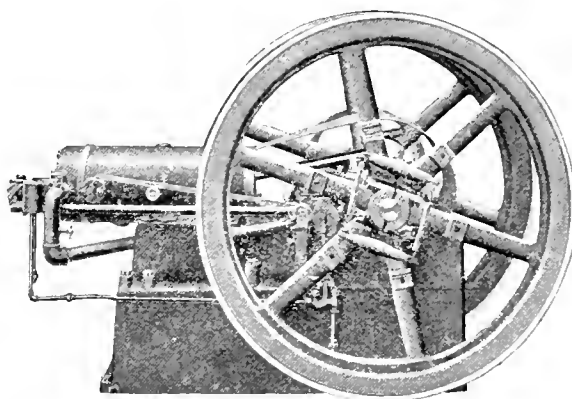


Steers Make Rapid Gain on Ground Feed

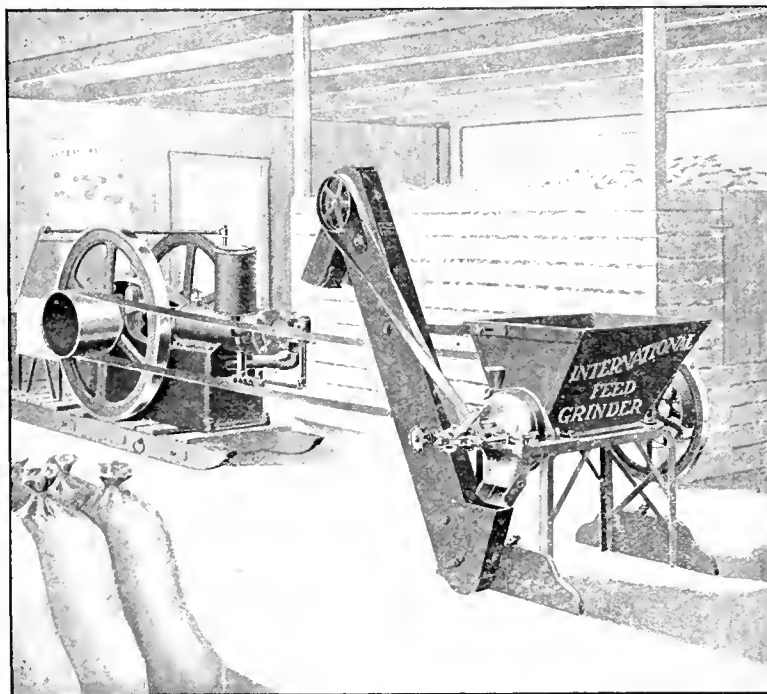
Ever Ready Power

The gasoline engine is the real practical power producer on the modern farm. Gasoline power can be applied not only in the field but also to the smaller jobs around the house, tool house, and barn. It will furnish convenient power for operating the feed grinder, and is especially adaptable for this purpose on account of the variation in the power required in proportion to the kind of grain being ground. No matter how much power the feed grinder needs to do its work properly, the I H C gasoline engine will easily handle the grain—and at so small an expense that the amount will hardly be noticed.

The engine can be started simply by closing the switch, opening the fuel valve, and giving the fly wheel a turn or two. A child can start it, but it does not even require a child to watch it when once started. It works steadily until the fuel is gone.



I H C Horizontal Gasoline Engine
4, 6, 8, 10, 12, 15, 20 and 25-Horse Power



An Ideal Combination

The I H C Line Includes

I H C Vertical engines—made in 2, 3, 25, and 35-horse power.

Horizontal (Portable and Stationary) in 4, 6, 8, 10, 12, 15, 20, and 25-horse power.

Famous air cooled engines—in 1, 2, and 3-horse power.

I H C Gasoline tractors in various styles and sizes.

Pumping, spraying, and sawing outfits.



